

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
9 June 2005 (09.06.2005)

PCT

(10) International Publication Number  
**WO 2005/052314 A1**

(51) International Patent Classification<sup>7</sup>: **E21B 37/02**,  
17/05, 21/10

McCrae [GB/GB]; 20 Ashley Park North, Aberdeen AB10  
6SF (GB). MCGARIAN, Bruce [GB/GB]; 23 East Glebe,  
Stonehaven, Aberdeen AB3 2HW (GB).

(21) International Application Number:  
PCT/GB2004/004926

(74) Agents: GOODENOUGH, Nigel et al.; A.A. Thornton &  
Co., 235 High Holborn, London WC1V 7LE (GB).

(22) International Filing Date:  
23 November 2004 (23.11.2004)

(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0327308.3 24 November 2003 (24.11.2003) GB

(71) Applicant (*for all designated States except US*): SMITH  
INTERNATIONAL, INC. [US/US]; 16740 Hardy Street,  
Houston, TX 77205-0068 (US).

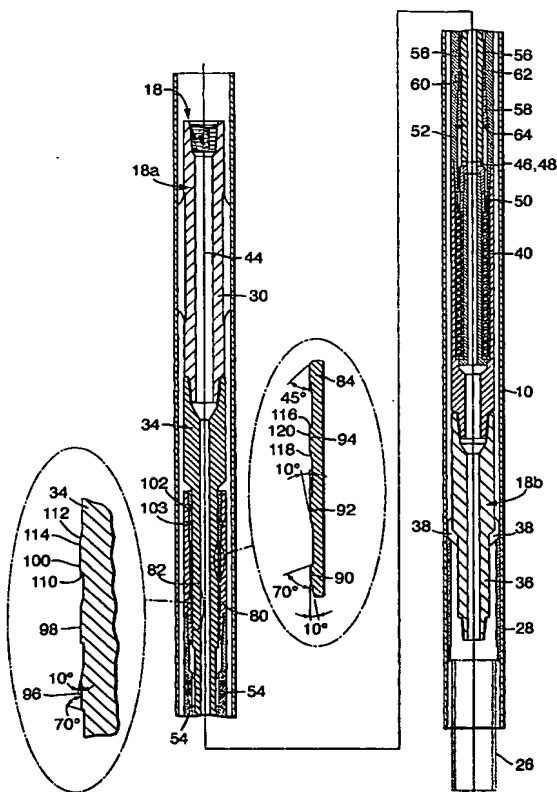
(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): TULLOCH, Rory,

[Continued on next page]

(54) Title: DOWNHOLE SWIVEL JOINT ASSEMBLY AND METHOD OF USING SAID SWIVEL JOINT ASSEMBLY



(57) Abstract: A downhole swivel joint assembly (18) comprised an upper component (18a) and a lower component (18b). The components may assume either of two stable positions relative to each other, namely an unactivated configuration (as shown in Figure 2) in which the components are rotationally fast with each other by virtue of the inter-engagement of splines (54) of the lower component with splines (56) of the upper component and an activated configuration in which the respective splines are disengaged so that the upper and lower components can rotate relative to each other. In the activated configuration the upper component is supported relative to the lower component on a ball bearing pack (42). Movement of the components between the activated and unactivated configurations is controlled by a resiliently deformable latch member (84) which is C-shaped in transverse cross-section. The latch member has an internal profile which co-operates with an external profile provided on the upper component mandrel (34) to allow the upper and lower components to snap between the activated and unactivated configurations.



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *with international search report*